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09/493,091	01/28/2000	Patrick Brindel	Q57709	1773

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EXAMINER

LI, SHI K

ART UNIT PAPER NUMBER

2633

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/493,091

Applicant(s)

BRINDEL ET AL.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 June 2005 and 22 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 June 2005 has been entered.

### ***Allowable Subject Matter***

2. The indicated allowability of claims 10 and 18 is withdrawn in view of the newly discovered reference(s) to Okuno et al. (U.S. Patent 6,480,312 B1) and Grasso et al. (WO 98/05133). Rejections based on the newly cited reference(s) follow.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 16 recites the limitation "wherein a number of regenerators in a set of regenerators of said at least one set of channel regenerators depends at least partially on the number of channels in said transmission system" in lines 1-3 of the claim. The specification as originally filed does not teach the

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limitation in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "a plurality of spaced optical regenerators" in line 3 of the claim. It is unclear whether these optical regenerators are the same as the channel regenerators as recited in line 7 of claim 1 or they are different regenerators.

Claim 16 recites the limitation "wherein a number of regenerators in a set of regenerators of said at least one set of channel regenerators depends at least partially on the number of channels in said transmission system" in lines 1-3 of the claim. The phrase "depends at least partially" is unclear and renders the claim indefinite.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-4, 9-10, 14-15 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Okuno et al. (U.S. Patent 6,480,312 B1).

Regarding claim 1, Okuno et al. discloses in FIG. 1A a WDM fiber optic transmission system comprising transceivers 1 and 2, optical fiber 200 and a set of amplifiers 41 and 44. Amplifier 41 regenerates channel  $\lambda_1$  and amplifier 44 regenerates channels  $\lambda_2$ . Therefore, the channel regenerated by amplifier 41 and the channel regenerated by amplifier 44 form non-overlapping subsets of the total channels carried by the fiber. FIG. 1A indicates that amplifier 41 and amplifier 44 are positioned at a predetermined distance on the optical line from each other.

Regarding claim 2, the total number of channels is 2 and each regenerator regenerates 1 channel, which is a submultiple of 2.

Regarding claims 3 and 15, each of amplifiers 41 and 44 regenerates one channel.

Regarding claim 4, Okuno et al. teaches in FIG. 1A optical amplifiers.

Regarding claim 9, Okuno et al. teaches in FIG. 1A circulator 51 for extracting channel and coupler 21 for inserting channel.

Regarding claim 10, Okuno et al. teaches in FIG. 1A amplifier 42 and amplifier 43 for compensating intensity.

Regarding claim 14, Okuno et al. teaches in FIG. 1A spaced optical amplifiers 41 and 44 and spaced regenerator cites.

Regarding claim 20,  $\lambda_1$  is regenerated by amplifier 41 and  $\lambda_2$  is regenerated by amplifier 44.

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9. Claims 1-2, 5, 10 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Grasso et al. (WO 98/05133).

Regarding claim 1, Grasso et al. discloses in FIG. 1 a WDM fiber optic transmission system comprising transmitters 1A and 1B, optical receivers 2A and 2B, optical fiber 8 and a set of channel regenerators 93 and 94. It is understood that amplifier 93 regenerates channels  $\lambda_1, \lambda_3, \dots, \lambda_{31}$  and amplifier 94 regenerates channels  $\lambda_2, \lambda_4, \dots, \lambda_{32}$ . Therefore, the channels regenerated by amplifier 93 and the channels regenerated by amplifier 94 form non-overlapping subsets. In FIG. 1, there are two bi-directional amplifier sites 9. Let us label the amplifiers associated with the left bi-directional amplifier site with subscript  $a$  and label the amplifiers associated with the right bi-amplifier site with subscript  $b$ . The amplifier 93<sub>a</sub> and amplifier 94<sub>b</sub> form a set of channel regenerators that also meet the last limitation of claim 1 such that amplifier 93<sub>a</sub> and amplifier 94<sub>b</sub> are positioned at a predetermined distance on the optical line from each other.

Regarding claim 2, the total number of channels is 32 and each regenerator regenerates 16 channels, which is a submultiple of 32.

Regarding claim 5, each regenerator of FIG. 1 regenerates 16 channels.

Regarding claim 10, Grasso et al. teaches in FIG. 1 amplifier 94a and 93b for compensating intensity.

Regarding claim 20, each channel is regenerated by either amplifier 93<sub>a</sub> or amplifier 94<sub>b</sub> and is not regenerated by any other regenerator of the set of channel regenerators consisting of amplifiers 93<sub>a</sub> and 94<sub>b</sub>.

***Claim Rejections - 35 USC § 103***

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10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grasso et al. (WO 98/05133) in view of Cao (U.S. Patent 6,396,607 B1).

Grasso et al. has been discussed above in regard to claims 1-2, 5, 10 and 20. The difference between Grasso et al. and the claimed invention is that Roberts et al. does not teach means for synchronizing a plurality of channels. Cao teaches in FIG. 1 an optical regenerator that synchronizes and regenerates a plurality of channels. One of ordinary skill in the art would have been motivated to combine the teaching of Cao with the optical transmission system of Grasso et al. because the optical regenerator of Cao supports high speed channels. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an optical regenerator for red band channels, as taught by Cao, in the optical transmission system of Grasso et al. because the optical regenerator of Cao supports high speed channels.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okuno et al. (U.S. Patent 6,480,312 B1) in view of Yano (U.S. Patent 6,108,125).

Okuno et al. has been discussed above in regard to claims 1-4, 9-10, 14-15 and 20. The difference between Okuno et al. and the claimed invention is that Okuno et al. does not teach a synchronous modulator. Yano teaches in FIG. 6 an optical repeater with EA modulator 210 for reshaping, retiming and regenerating optical signal. One of ordinary skill in the art would have been motivated to combine the teaching of Yano with the WDM transmission system of Okuno et al. because the repeater of Yano retimes the signal for removing jitters in addition to reshaping the signal. Thus it would have been obvious to one of ordinary skill in the art at the

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time the invention was made to use the optical repeater of Yano in the WDM transmission system of Okuno et al. because the repeater of Yano retimes the signal for removing jitters in addition to reshaping the signal.

13. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasso et al. (WO 98/05133) in view of Kinoshita (U.S. Patent 6,023,366).

Grasso et al. has been discussed above in regard to claims 1-2, 5, 10 and 20. The difference between Grasso et al. and the claimed invention is that Grasso et al. does not teach supervisory channel. Kinoshita teaches in FIG. 1 to use a dedicated channel  $\lambda_{SV}$  for supervisory purpose. One of ordinary skill in the art would have been motivated to combine the teaching of Kinoshita with the transmission system of Grasso et al. because a supervisory channel can be used to convey information about channels for the payload and monitor the status of amplifiers and repeaters. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a dedicated channel for supervisory purpose, as taught by Kinoshita, in the transmission system of Grasso et al. because a supervisory channel can be used to convey information about channels for the payload and monitor the status of amplifiers and repeaters.

Regarding claim 12, Kinoshita teaches in FIG. 1 means 24 for separating the dedicated channel.

Regarding claim 13, Kinoshita teaches in FIG. 2 the delivery of optical output signal to the supervisory unit.

14. Claims 3 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grasso (WO 98/05133) in view of Shimomura et al. (U.S. Patent 6,400,498 B1).



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Grasso et al. has been discussed above in regard to claims 1-2, 5, 10 and 20. The difference between Grasso et al. and the claimed invention is that Grasso et al. does not teach that each group includes only one channel. Shimomura et al. teaches in FIG. 26 an optical signal repeating and amplifying device comprising a set of amplifiers (regenerators) where each amplifier regenerates one channel. One of ordinary skill in the art would have been motivated to combine the teaching of Shimomura et al. with the WDM transmission system of Grasso et al. because the repeating and amplifying device of Shimomura et al. removes ASE noise and can also equalization optical levels (see col. 22, lines 50-52 of Shimomura et al.). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use one amplifier for each channel, as taught by Shimomura et al., in the WDM transmission system of Grasso et al. because the repeating and amplifying device of Shimomura et al. removes ASE noise and can also equalization optical levels. Note that in the modified WDM transmission system of Grasso et al. and Shimomura et al., amplifier 93a is replaced by a number of amplifiers, one for each of channels  $\lambda_1, \lambda_3, \dots, \lambda_{31}$  and amplifier 94b is replaced by a number of amplifiers, one for each of channels  $\lambda_2, \lambda_4, \dots, \lambda_{32}$ . The amplifier for  $\lambda_1$  and the amplifier  $\lambda_2$  form a set of regenerators positioned at a predetermined distance on the optical line from each other.

Regarding claims 16-17, Shimomura et al. teaches in FIG. 26 that the number of amplifiers depends on the number of channels.

Regarding claim 18, Grasso et al. teaches in FIG. 1 amplifier 94a and 93b for compensating intensity.

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Regarding claim 19, each amplifier regenerates one channel and that channel is not regenerated by other amplifiers.

***Allowable Subject Matter***

15. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

16. Applicant's arguments with respect to claims 1-7 and 9-20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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skl  
26 October 2005



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